01CI0101: Elements of Civil Engineering

Objective of the Course

The main objective to give the course fundamentals of civil engineering is

- To familiar students with the Mother branch of Engineering and students will have a broad perspective to identify the oldest branch of engineering providing basic infrastructure for development of civilized society.
- With an understanding of principles associated with civil engineering the students will persuade different civil engineering works like buildings, transportation and water & Drainage systems which are an integral part of very engineering professional's life irrespective of the discipline.

Credits Earned : 4

Students Learning Outcomes

After studying this subject students will be able to:

- Recognize importance of Civil engineering and its day to day applications
- Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
- Describe qualitative comparison between different materials and its selection.
- Analyse the water resources, its harvesting and its consumptive use.
- Create & interpret building planning and will be able to draw plan, section and elevation.
- Acquaint with the various modes of transportation.

Teaching and Examination Scheme

Subject Name	Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
	Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term Work (TW)	
Element of Civil Engineering	3	0	2	4	50	30	20	25	25	150

Detailed Syllabus

Sr. No.	Topic Name	Hours
1	**Introduction to civil Engineering**	**03**
	Scope of civil Engineering & Role of civil Engineer	
	Unit conversion, common units used in practice of civil engineering	
2	**Elements of Surveying**	**17**
	Introduction: Applications, Fundamental Principles and Classification of Surveying, Classification of plans & maps	
	Linear Measurement: Methods, Instruments used in Chain Surveying, Selection of Stations, Chaining, Ranging, Offsetting.	

Sr. No.	Topic Name	Hours
2	**Angular Measurement:** Instruments used, Types of Compass, Types of Meridians and bearings, Measurement of bearings, Computation of angles. Compass traversing and correction of bearings for local attraction.	
	Levelling: Aims and applications, Definition of various terms, Instruments for levelling, Methods of levelling, Recording observations in level-book, Computing reduced levels by HI and rise & all method, Definition of contour, Characteristics of contours of different terrains and application of contour maps.	
	Modern Surveying: Measurement by Electronic devices, Introduction to GIS, GPS & Remote sensing	
3	**Building Materials**	**05**
	Introduction, properties & classifications of materials: Bricks/blocks, cement, lime, sand, aggregates, stone, ceramic, glass, concrete, Ferrous metals & Nonferrous metals, glass, timber and modern materials	
4	**Building Planning and It's Component**	**06**
	Classification of buildings, Principles of planning, Conceptual planning of Residential & Public building, Building components & their functions, types of load on building	
5	**Transportation Engineering**	**05**
	Role of transportation in National Development, Modes of Transportation, Types of Roadways, Introduction to Traffic Engineering,, Introduction to Urban Transportation system	
6	**Water Resource Engineering**	**04**
	Hydrological Cycle, Types of Water Resources, Water Demand & Water Scarcity Water Use and Its Conservation Techniques, Storage Structures, Water Conveyance	
7	**Next Generation Civil Engineering**	**02**
	Building Automation, Green Building, Advanced Materials, Sky Scrapers, Civil Engineering Wonders in the world	
Total		**42**

List of Practicals

1) Chain and Compass Survey Project.

2) Profile Leveling Survey Project.

3) Basics sign & conventional symbol drawing sheet

4) Building planning drawing sheet

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
30%	30%	10%	10%	10%	10%

Instructional Method and Pedagogy

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
3. Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation.
4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%.
6. Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Minimum 8 experiments are planned based on the course content.
8.

Recommended Study Material

Text Books:

Introduction to civil Engineering by Bhogayata, Shah & Vora – Tata McGraw hill

Reference Books:

1. Surveying Vol. I by B.C. Punamia
2. Building construction by B.C. Punamia
3. Building Material by S.C.Rangwala
4. Hydrology & Water resource engineering by S.K.Garg
5. Highway & Transportation engineering by Khanna & Justo